

Claims

WHAT IS CLAIMED IS:

1. - 10. (canceled)

11. (new) A camshaft adjusting system for an internal combustion engine, the camshaft adjusting device comprising:

a camshaft adjusting device with a first hydraulic chamber and a second hydraulic chamber, wherein the first and second hydraulic chambers act in opposition to one another;

a control valve group working as a 4/4-way valve system and comprising a first connection to the first hydraulic chamber, a second connection to the second hydraulic chamber, a tank connection, and a connection for pressurization;

wherein the camshaft adjusting system in a first state of the control valve group, when starting the internal combustion engine, is pressure-relieved relative to the tank connection by simultaneously hydraulically connecting the first and second connections of the camshaft adjusting device so that the camshaft adjusting device moves into a dwell position with a single locking mechanism and said dwell position also provides a safety function in case of system failure.

12. (new) A camshaft adjusting system according to claim 11, wherein control valve group is a single 4/4-way valve.

13. (new) A camshaft adjusting system according to claim 12, wherein the first state is the operating end time state of the camshaft adjusting system.

14. (new) A camshaft adjusting system according to claim 12, wherein the 4/4-

way valve has a second state for a retarded adjustment of the camshaft adjusting device, wherein in the second state the first connection is connected to the tank connection and the second connection is connected to the connection for pressurization; wherein the 4/4-way valve has a third state for a holding position of the camshaft adjusting device, in which holding position the first and second connections are simultaneously disconnected from the tank connection and the connection for pressurization; wherein the 4/4-way valve has a fourth state for an advance adjustment of the camshaft adjusting device, in which fourth state the first connection is connected to the connection for pressurization and the second connection is connected to the tank connection.

15. (new) A camshaft adjusting system according to claim 14, wherein the first, second, third, and fourth states are adjusted by a linear movement of a hydraulic piston of the 4/4-way valve, wherein the first, second, third, and fourth states are sequentially reached in accordance with the ordinal number assigned to the first, second, third, and fourth states, respectively, wherein a movement between the first, second, third, and fourth states is possible into a state of the next higher or next lower ordinal number.

16. (new) A camshaft adjusting system according to claim 14, wherein the 4/4-way valve is a cartridge valve that is spring-loaded at one end and comprises a sleeve and a hydraulic hollow piston adapted for tank pressure relief, wherein the first, second, third, and fourth states are determined by an overlap between the hollow piston and the sleeve.

17. (new) A camshaft adjusting system according to claim 11, wherein, when the camshaft adjusting system is pressure-relieved, the camshaft adjusting device automatically moves into the dwell position during the period of the first state.

18. (new) A camshaft adjusting system according to claim 11, wherein the locking mechanism locks in the first state and unlocks when a predetermined pressure difference between the first and second hydraulic chambers is exceeded.

19. (new) A camshaft adjusting system according to claim 11, wherein the camshaft adjusting device is an oscillating motor camshaft adjusting device.

20. (new) An internal combustion engine comprising an engine control unit and a camshaft adjusting system according to claim 11, wherein a turn-off state of the camshaft adjusting system is determined by a no-load voltage, a no-load current, or a no-load pulse-width signal when dropping below a threshold value.